

REMARKS

RESTRICTION

The April 27, 2006 Office Action has maintained the restriction requirement over Applicant's March 2, 2006 traversal. Claims directed to non-elected groups and species have been canceled herein. Applicant reserves the right to file a divisional application(s) directed to these claims.

REJECTIONS

Claims 17-19 and 21 have been rejected under 35 U.S.C. §102(a) as anticipated by Ha et al. (J. Power Source 112 655-659) ("Ha et al."), and as anticipated under 35 U.S.C. §102(b) (or, in the alternative as obvious under 35 U.S.C. §103(a)) over U.S. Patent No. 5,904,740 to Davis ("Davis"). Claims 18-19 have additionally been rejected under 35 U.S.C. §103(a) as obvious over Davis and in further view of Ha et al. Claim 20 has been rejected under 35 U.S.C. §103(a) as obvious over Davis and further view of U.S. Patent Publication No. 2003/0170508 A1 to Beckmann ("Beckmann"). Claim 22 has likewise been rejected under 35 U.S.C. §103(a) over Davis in view of Beckmann and claim 23 has been rejected under 35 U.S.C. §103(a) as obvious over Davis and Beckmann in further view of U.S. Patent No. 5,898,113 to Vecere.

BECKMANN FAILS TO DISCLOSE OR SUGGEST CLAIM 17'S REQUIRED GAS REMOVER

Claim 17 has been amended to include the limitations of claim 20 as well as additional limitations, and is allowable. Claim 20 has been canceled and claims 18-19 and 21-23, all of which depend from claim 17, are allowable for the same reasons as are claim 17. As amended, claim 17 includes the limitations of original claim 20 together with additional aspects of a preferred embodiment fuel cell of the invention "having a gas remover comprising a plurality of passages that are configured to allow passage of CO₂ from said enclosure while substantially preventing passage of said organic fuel solution, said plurality of passages positioned to promote circulation of said organic fuel solution

as gas travels therethrough”. The combination of Davis and Beckmann (as well as any other cited reference) fails to disclose or suggest the invention of amended claim 17.

In rejecting original claim 20, the Office Action alleged that Beckmann disclosed a gas remover (now a feature of claim 17) and cited the single opening 72 of Beckmann’s fuel cell (shown in FIG. 6) for support. It is submitted that Beckmann’s single opening 72, however, does not meet amended claim 17’s requirements. For example, Beckmann discloses only a single opening 72 and therefore fails to disclose the required plurality of passages. As discussed in the specification, a gas remover configuration having a plurality of passages has been discovered to provide advantageous circulation of the fuel solution as well as other benefits related to cell cost, size, and efficiency. Page 17, lines 23-25.

In addition to failing to disclose the required plurality of passages, Beckmann discloses a fuel cell that is different from the claimed structure in some important aspects. For example, Beckmann teaches an active fuel cell as opposed to the passive cell claimed in claim 17. Active fuel cells differ from passive fuel cells in that they depend on an active feed of fuel solution. See Specification, p. 10, lines 10-13. This is apparent in some of the structural differences between Beckmann’s disclosure and the cell of claim 17.

For example, Beckmann fails to disclose that its passive cell single opening 72 be positioned to promote the circulation of the fuel solution as is required by claim 17. Beckmann teaches actively feeding a fuel solution to its cell through opening 69 as dilute fuel solution exits the cell through opening 71. FIG. 6, para. 41. Some circulation is required in order for the actively fed fuel solution to travel from the entrance opening 69 to the exit opening 71. For this reason, one considering Beckmann would not be led to the claimed plurality of passages that are positioned to promote circulation of the fuel solution as gas travels therethrough as is required by claim 17.

Claim 17 is allowable over the cited references for these and other reasons. The cited references, including Beckmann, fail to disclose or suggest the requirements of claim 17 which include, among other elements, a passive cell having a plurality of gas

remover passages that are positioned to promote circulation of the fuel solution. Because claims 18-19 and 21-23 depend from claim 17, they are likewise allowable.

NEW CLAIMS 51-57 ARE ALLOWABLE

Several new claims depending from claim 17 have been presented for consideration and are allowable. Each is directed to an invention embodiment which includes gas remover elements in addition to those required by claim 17. New claim 51 requires that the gas remover comprise at least five passages. New claim 52 requires that each of the plurality of passages have an entrance extending inward into the anode enclosure that is separated from the at least one anode enclosure wall. New claim 53 requires the entrance be separated from the wall by at least 0.01 inch. As discussed in the specification, it has been discovered that this example configuration is useful to promote circulation of fuel solution (page 17, lines 19-22, see also FIGS. 9-10).

Claim 54 requires a particular length to diameter ratio of the passages and a hydrophobic interior surface. New claim 55 requires a ratio of about 20 passages per cm² of useful anode surface area. Claim 56 depends from claim 55 and further requires that each of the passages has a diameter of no more than about 1/32 inch. New claim 57 requires at least a first gas remover passage in a first enclosure wall and a second passage in a second wall. The requirements of claims 51-57 are not suggested or disclosed by Beckmann or any other cited reference with the result that these new claims are allowable.

NEW CLAIMS 58-61 ARE ALLOWABLE

New independent claim 58 has been presented for consideration and is directed to an organic fuel cell comprising, among other elements, an anode enclosure defined by a plurality of walls that contains a formic acid organic fuel solution of at least about 1.8 molar concentration. The anode enclosure has a gas remover that comprises at least 5 passages penetrating at least one of the plurality of anode enclosure walls.

Beckmann nor any of the other cited references disclose or suggest this required gas remover configuration with the result that new claim 58 is allowable.

New claims 59-61 depend from new claim 58 and are allowable for the same reasons as are claim 58. New claims 59-61 are allowable for other reasons as well. Each requires additional gas remover structural elements that are not disclosed or suggested by any of the cited references. New claim 59 requires that each of the at least five passages have an entrance that is separated by at least about 0.01 inch from the at least one of the anode enclosure walls whereby the entrances extend into the enclosure. New claim 60 requires a particular passage diameter, a particular length to diameter ratio, and particular construction of the interior surface for the at least five passages. New claim 61 requires that the at least five passages penetrate a single wall that is adjacent to said anode.

NEW CLAIMS 62-63 ARE ALLOWABLE

New independent claim 62 has been presented for consideration and recites an organic fuel cell comprising, among other elements, an anode enclosure defined by a plurality of walls that contains a formic acid fuel solution having a concentration of at least about 1.8 molar formic acid. The anode enclosure includes a gas remover that comprises at least five passages, each having an entrance that is separated from the at least one wall by a distance. New claim 63 depends from claim 62 and further requires that the at least five passages have a diameter of no more than about 1/32", and at least a portion of the at least five passages are in an anode enclosure wall that is adjacent to the anode. The cited references, either alone or in combination, fail to disclose or suggest these required structural elements.

PROVISIONAL OBVIOUSNESS DOUBLE PATENTING REJECTION

Claims 17-23 have also been provisionally rejected under the judicially created doctrine of obviousness type double patenting as unpatentable over claims 1-26 of co-pending application no. 10/407,385. Because the claims as allowed in the co-

pending application have been amended from their original form and the claims as amended herein include requirements that were not previously required, the two claim sets are patentably distinct, and the provisional rejection should be withdrawn.

AMENDMENT TO SPECIFICATION AND DRAWINGS

Page 21 of the specification and FIG. 13 shown on sheet 7 of the drawings have been amended herein to correct typographical errors. Specifically, several element numbers have been changed both in the specification and in the Replacement Sheet showing FIG. 13 provided herewith. With reference to FIG. 13, the loading tube originally labeled as element 356 has been re-labeled as element 354 in the replacement sheet to agree with the specification. The check valve originally labeled 358 has been re-labeled as element 356 in the replacement sheet. No other changes have been made to the replacement sheet as compared to original FIG. 13. Because only element numbers have been changed, no annotated sheet showing changes is necessary. MPEP 608.02(v).

OTHER CITED REFERENCES

Comment is not necessary and has therefore not been provided herein regarding references other than Beckmann that were cited to support rejections that have been made moot following the above amendment of claim 17. The lack of discussion of these references herein is not an admission regarding any of these references.


CONCLUSION

As a result of the amendments made herein, it is respectfully submitted that all the claims are in condition suitable for allowance. Timely allowance is respectfully requested.

Respectfully submitted,

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July 27, 2006

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